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of the cross section of the thallus, is not so in reality. Familler (3, p. 14) has shown that typical *R. pseudo-Frostii*, in some of his cultures, became directly transformed into *R. Huebeneriana*, and Nicholson (6, p. 202) has confirmed these results by careful observations in the field. There is every reason to suppose that *R. fluitans* is fully as variable as *R. Huebeneriana*. The so-called "broad form" of Von Gaisberg and the terrestrial form obtained by Donaghy in his study of the aquatic *R. fluitans* should therefore be subjected to a more rigid scrutiny than they have yet received, in order to determine whether their distinctive features are constant or inconstant in character. Until this is done their status must remain uncertain. Renewed search should likewise be made for the aquatic form of *R. fluitans* in fruiting condition, in order to determine whether or not the marginal lobing of the Tempelhof specimens represents a constant feature and also to compare the spores with those of the terrestrial form.

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THE MOSSES OF THE OXFORD UNIVERSITY EXPEDITION TO SPITZBERGEN, 1921[1]

H. N. DIXON, M. A., F. L. S.

The mosses sent to me for determination were collected by three of the botanists who took part in the expedition, in June—August, 1921. Part of them were collected and sent to me by Mr. John Walton, and were collected about Klaas Billen Bay, mostly in the neighborhood of Bruce City. The remainder were sent by Mr. V. S. Summerhayes and were mostly collected by himself in various localities (Bear Id., Prince Charles Foreland, &c.); but a certain number of them were gathered by Mr. C. S. Elton in the neighborhood of Klaas Billen Bay.

The number of species found among these collections was about 82, out

[1] Constituting Number 17 of the Results of the Oxford University Expedition to Spitzbergen, 1921.

of a total number recorded for Spitzbergen, as far as I am aware, of just under 200. The mosses of Spitzbergen have been so carefully studied and enumerated by Berggren in the Musci et Hepaticae Spetsbergenenses (K. Vet. Akad. Handl. XIII. 1875) that not much room has been left for further additions. In this work he enumerates 189 species of mosses. The only literature that I know which has added further to the list of mosses is a paper of Hagen's on the Mosses and Hepatics of Prince Charles Foreland, Spitzbergen, (Trans. Bot. Soc. Edin. XXIII. 1908), in which 3 species are added, and one by Bryhn, "Bryophyta pro flora Spitzbergensi nova," (Nyt Mag. for Naturvidensk. Bd. XLVII. 1909), adding 4 more. These bring the number up to 196. It is possible that I have overlooked some papers on the subject, but I believe that the above pretty well exhaust the list.

The 82 species in the present collections comprise 5 distinct species new to the group, in addition to one or two which are in the nature of segregates, and may be included by Berggren in the "aggregate" species recorded by him. The 5 additional species are as follows:—

Sphagnum subsecundum var. *contortum*
Grimmia commutata
Orthotrichum rupestre
Cinclidium stygium
Amblystegium serpens

In addition to these, *Sphagnum subnitens* and *Philonotis tomentella* have not been distinguished from *S. acutifolium* and *P. fontana* respectively. I give further particulars as to these and a few other plants of interest.

Sphagnum subsecundum var. *contortum* Schimp.—Advent Bay; 25 June, V. S. Summerhayes (28a).

Sphagnum subnitens Russ. & Warnst.—Advent Bay; 18 July, V. S. Summerhayes (123b). Probably included by Berggren in the aggregate *Sphagnum acutifolium.*

Sphagnum fimbriatum var. *concinnum* Warnst. (Syn. *S. teres* var. *concinnum* Bergg.; *S. fimbriatum* var. *arcticum* Jens.); det. J. A. Wheldon. An interesting and difficult form which has been placed under two or three different names; it has rather the habit of *S. Girgensohnii*, but the stem leaves are rather those of *S. fimbriatum.* It was collected by V. S. Summerhayes, Cape Boheman; 12–16 July, (95b).

Dicranum Starkii Web. & Mohr.—Bear Id.; 17–20 June, V. S. Summerhayes (9ad). A very puzzling, sterile plant, which appears to belong here, with the habit of *Blindia acuta*, and a very fine leaf subula, which is denticulate for some distance down. The alar cells are too strongly marked for *D. fulvellum.*

Dicranum Bonjeani De Not.—Bear Id.; 13–20 July, V. S. Summerhayes (9p). Advent Bay; June 25, (28d). The type form: Berggren found only var. *juniperifolium.*

Grimmia commutata Huebn.—Klass Billen Bay; 14 Aug., C. S. Elton (L25). A very remarkable form; robust, brown, with the leaves decidedly crisped when dry, the upper cells larger and clearer than in the usual form, and the cells and

nerve somewhat markedly papillose. The leaf form, however, and the distinctive basal areolation, are quite characteristic of *G. commutata*, and I think that it must be referred here. Mr. W. E. Nicholson concurs. The species has not been found in Spitzbergen before.

Rhacomitrium canescens (Hedw.) Brid.—Prince Charles Foreland; 8 July, V. S. Summerhayes (67b). A striking form, with the stems almost simple, or once or twice divided, the short lateral branchlets being undeveloped. The yar. *ericoides*—the exact antithesis of this—was collected, also on Prince Charles Foreland, by Mr. C. S. Elton (Z4).

Orthotrichum rupestre Schleich.—Rock in Eriophorum Moss, Bruce City; J. Walton (L). Not hitherto on record for Spitzbergen.

Bryum globosum Lindb.—Bear Id.; 13–23 June, V. S. Summerhayes (6b), with one or two old capsules: Bruce City; 19–20 July, V. S. Summerhayes (124b), with abundant capsules, both the somewhat immature, operculate capsules of the present year and the old capsules of the preceeding season, in, however, fairly good condition, with the peristome nearly intact. The globose, inflated capsules, of thin texture, agree exactly with Lindberg's specimens in our National collections, and in the fresh state, and in their dense profusion, made an object of great beauty; which, alas! disappeared to a great extent in drying.

Var. **ruberrimum** Dixon, *var. nov.*—Tundra, Klaas Billen Bay; 5 Aug., C. S. Elton (K23). Theca pulcherrime rosea. Lindberg describes the capsules of *B. globosum* as "pallide vinosa," but the reddish color must be very faint; in his specimens at Kew and the British Museum I do not find any trace of red; as in Nos. 6d and 124b, above, they are a pale brown. This applies both to the somewhat immature capsules of Mr. Summerhayes, gathering and to the mature deoperculate ones. In the present plant the capsules are of equal abundance, and of precisely the same form and character, but are of a very bright rosy red, and even in the dry state make an extremely striking object. Arnell speaks of the type of *B. globosum* as being the greatest ornament of the Arctic zone, but it is certainly far surpassed by this very beautiful variety:—"matris pulchrae filia pulchrior."

Cinclidium stygium Sw.—Gips Valleys; 26 June, V. S. Summerhayes (30e), sterile. Berggren records only *C. arcticum* B. & S., but the present plant cannot be that, as the cells are distinctly in divergent rows.

Meesia triquetra (L.) Aongstr.—In several localities. Limpricht (Laubm. p. 515) describes the leaves as "ganzrandig, nur bei den Varietäten rings gesägt." This seems to be a rather remarkable statement. I do not remember to have seen a form with entire leaves. The leaves are described as toothed by all the authors I know, and are so figured in the Bryologia europaea.

Philonotis tomentella Mol.—Sassen Valley; 17 July, V. S. Summerhayes (118a). Not hitherto recorded from Spitzbergen, but doubtless included in the forms recorded by Berggren as *P. fontana* Brid.

Polytrichum alpinum L.—A form from Prince Charles Foreland, V. S. Summerhayes (57 o) has the stems divided at the apex into numerous short, crowded branches, so as to be quite dendroid. This form occurs from time to

time, not only in *P. alpinum*, but in other species of the genus, and has led in one case at least, in South Africa, to the erroneous record of *Dendroligotrichum* as occurring there.

Climacium dendroides (L.) Web. & Mohr.—Bear Id.; 17 June, V. S. Summerhayes (4b). Berggren records a single stem only, from King's Bay.

Thuidium abietinum (L.) B. & S.—One or two gatherings were made of this. Berggren records it only from Green Harbour and Advent Bay.

Amblystegium serpens (L.) B. & S.—Bear Id.; 17 June, V. S. Summerhayes (79). Sterile: not previously recorded from Spitzbergen.

Calliergon sarmentosum var. *fontinaloides* Berggren.—Cape Boheman; 15 July, V. S. Summerhayes (110a). The exact habitat of this remarkable form is not given, but I have no doubt it was a submerged form. It appears to conform very fairly with Berggren's description of his var. *fontinaloides* (of which I have seen no specimens)[1] from the Dovre, Norway, but is, I should judge, a still more extreme form. The stems are 15 cm. long, very closely and regularly pinnate with short, subequal, widely divergent, elongate, much attenuated leaves. The plant has, in fact, in almost every particular (except that the leaves are straight, not falcate) the appearance of a *Drepanocladus* such as *D. Rotae*, and it is hard to convince oneself, even when examining it with the lens, that it is not that, but a *Calliergon*. The lower part of the stem and the lower branches are much denuded, which appears to indicate a station in flowing water.

The variety has only been recorded from the high alps of Styria in addition to the original locality. I have a somewhat similar form from New Zealand, collected by Dr. L. Cockayne "on bottom of shallow natural pond in Craigieburn Mts., Canterbury, at 1200 m. alt."

NORTHAMPTON, ENGLAND

ON SOME MOSSES FROM THE BLUE MOUNTAIN OF CUBA

ELIZABETH G. BRITTON

On April 10th; 1922 Mr. George Conrad Bucher spent the day on the summit of the highest peak of Cuba, Pico Turquino, 7600 feet and collected six mosses which are interesting because of their rarity and identity with those from the Blue Mountains of Jamaica, occurring on Sir John Peak and Blue Mountain Peak, at altitudes ranging from 5000 to 7400 feet, and including three new records for Cuba.

Holomitrium calycinum (Sw.) Mitt.

Type locality: Jamaica, widely distributed at elevation of 5000–7420 feet, usually on tree trunks. Recently collected by Fre. Clement in the Sierra Maestra. No. 28, Bucher.

Campylopus Brittonae R. S. W. Second West Indian record!

Type locality: Summit of Sir John Peak, Jamaica.

[1] Since the above was in print Mr. Chamberlain has kindly sent me a specimen of the Norwegian plant, leg. Bryhn et Hogen, which quite confirms the original determination. The Spitzbergen plant is a somewhat more extreme form.